



56K CSU/DSU

INSTALLATION AND OPERATION MANUAL

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NOTICE

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NOTE: This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules. These rules are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, might cause interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user is required to correct the interference at his own expense.

This equipment also complies with Part 68 of FCC Rules.

FCC REGISTRATION NUMBER: 1R5USA-23056-DE-N

FCC FACILITY INTERFACE CODES:

04DU5-24: 2400 bps

04DU5-48: 4800 bps

04DU5-96: 9600 bps

04DU5-19: 19200 bps

04DU5-56: 56000 bps

SERVICE CODE: 6.0Y

JACK ARRANGEMENTS: RJ48S

Osicom Technologies wall-mount transformer (550-0366-01) must be used with the Routermate 56 to assure reliability and compliance with FCC and Underwriters Laboratories requirements.

1. INTRODUCTION	1-1
1.1 System Features	1-1
1.2 Functional Description	1-2
1.3 Application	1-3
2. INSTALLATION	2-1
2.1 Unpacking	2-1
2.2 Installation Checklist	2-2
2.2.1 Communications Line Requirements for CSU/DSU	2-2
2.3 FCC Part 68 Requirements for CSU/DSU	2-3
2.4 LED Indicators	2-3
2.5 Interfaces	2-4
2.5.1 Power	2-4
2.5.2 Network Interface	2-4
2.5.3 DTE Interface	2-4
2.5.4 Console/SLIP Interface	2-5
2.6 Terminal Management	2-6
2.7 SLIP Management	2-7
2.7.1 SNMP/Telnet Installation	2-7
2.8 Obtaining the Enterprise MIB	2-8
3. TERMINAL OPERATION	3-1
3.1 Screen Structure	3-1
3.2 Keys and Conventions	3-2
3.3 Terminal Selection	3-3
3.4 Password	3-4
3.5 Main Menu	3-5
3.5.1 Screen Path	3-5
3.6 DSU Diagnostics	3-6
3.6.1 Loopback Tests	3-6
3.6.2 Telco Loopback Tests	3-9
3.6.3 Statistics	3-9
3.6.4 Line Status	3-9
3.6.5 Control Lead Status	3-9
3.7 Configuration Menu	3-10
3.8 Unit Menu	3-12
3.8.1 System Restart	3-13
3.8.2 Service Information	3-14
3.9 Management Menu	3-15
3.10 SNMP Trap Client Table	3-17
4. MAINTENANCE AND REPAIR	4-1
4.1 Customer Support	4-1
4.1.1 Canadian Customers	4-1
4.2 Equipment Return and Repair	4-1

APPENDIX A. INTERFACES AND CABLES	A-1
APPENDIX B. ORDERING INFORMATION	B-1
APPENDIX C. SPECIFICATIONS	C-1
APPENDIX D. MULTIPURPOSE LABEL	D-1
INDEX	



Figure 1-1. Routermate 56K CSU/DSU

Osicom Technologies' ROUTERmate™ 56K CSU/DSU is a combined Channel Service Unit and Data Service Unit designed for use with AT&T's Digital Data System (DDS) and similar digital services. All DDSI speeds are supported.

The Routermate operates in point-to-point or multidrop polled installations and can also function as a point-to-point Limited Distance Modem (LDM) on a customer-owned 4-wire facility.

It includes a standard V.35 DTE interface.

Ordering information and part numbers for all versions of the Routermate are listed in Table B-1.

1.1	System Features	1-1
1.2	Functional Description	1-2
1.3	Application	1-3

1.1 System Features

Routermate 56 system features include:

Management

The Routermate can be managed by a variety of methods.

SNMP - An embedded Simple Network Management Protocol (SNMP) agent resides in the CSU/DSU. Osicom supplies an enterprise Management Information Base (MIB) that provides full configuration and diagnostic control.

Management Screens - A series of password-protected management screens can be accessed from an ASCII terminal or by a Telnet connection.

SLIP Management - The Routermate implements Serial Line Internet Protocol (SLIP), which enables SNMP and Telnet management. Telnet management involves making a Telnet connection to the Routermate's SLIP interface to access the management screens.

One Telnet connection is allowed at a time; however, Telnet and SNMP management can be performed at the same time.

Front Panel LEDs

Eight LEDs display data activity, control signal status, and diagnostic tests.

Diagnostic Tests

The Routermate continuously monitors the DDS line and reports any fault so that appropriate action can be taken. A variety of loopbacks and a test pattern generator/comparator are provided.

One of the diagnostic tests built into the Routermate is a V.54 remote digital loopback. This permits an unattended unit to respond to commands from a remote CSU/DSU or other V.54-compatible device.

In addition, the Routermate 56 supports both CSU and DSU loopbacks initiated by the Telco at the customer's request. See [DSU Diagnostics, page 3-6](#).

AT&T Compliance

The Routermate 56 complies with the following AT&T technical publications:

- 62310 – *DDS Channel Interface Specification*
- 41450 – *Digital Data System Data Service Unit Interface Specification*

1.2 Functional Description

The CSU/DSU transmits serial synchronous data over the DDS network or other 4-wire, unloaded, twisted pair cable systems. It uses a bipolar return-to-zero signal and accepts digital signals on a V.35 interface and converts them to a bipolar AMI format.

The receiving CSU/DSU converts the bipolar AMI format back to digital signals which are sent to the receiving device.

The CSU/DSU operates at the following synchronous speeds:

2400
4800
9600
19200
56000 bps

1.3 Application

Figure 1-2 illustrates the Routermate in a typical application. The Routermate can be accessed from anywhere on the network by an SNMP management station or any device using Telnet protocol, after making a Telnet connection. The user can view management screens and initiate diagnostics.

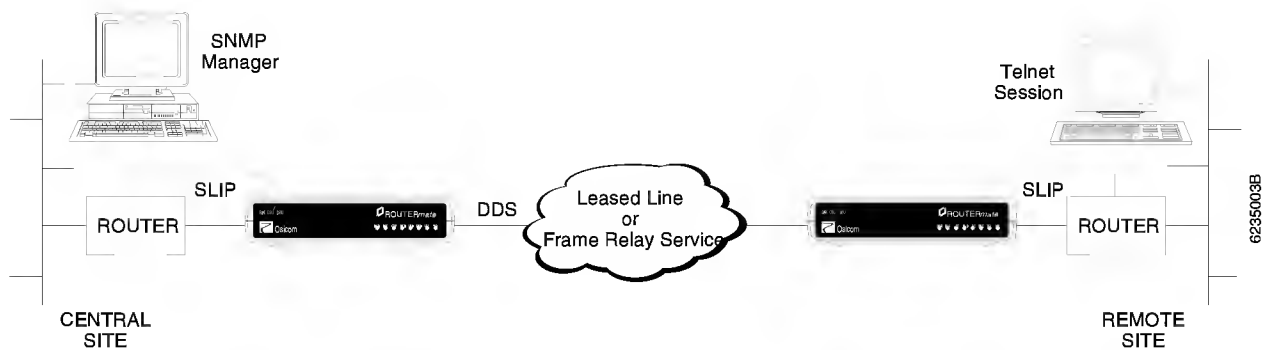


Figure 1-2. Routermate Application

INSTALLATION

This chapter describes the interface connectors and the installation of cables required to support applications for the Routermate 56, including terminal, SNMP, and Telnet management.

See [Chapter 3, Terminal Operation](#) for terminal screens and descriptions of the options and parameters.

2.1	Unpacking	2-1
2.2	Installation Checklist	2-2
2.2.1	Communications Line Requirements for CSU/DSU	2-2
2.3	FCC Part 68 Requirements for CSU/DSU	2-3
2.4	LED Indicators	2-3
2.5	Interfaces	2-4
2.5.1	Power	2-4
2.5.2	Network Interface	2-4
2.5.3	DTE Interface	2-4
2.5.4	Console/SLIP Interface	2-5
2.6	Terminal Management	2-6
2.7	SLIP Management	2-7
2.7.1	SNMP/Telnet Installation	2-7
2.8	Obtaining the Enterprise MIB	2-8

2.1 Unpacking

All equipment is normally shipped in cardboard cartons with foam inserts to protect the units from shock and vibration experienced during shipment. Upon arrival of the equipment, inspect the condition of the received cartons and compare all items to the packing list attached to the carton.

The following items are included with the unit:

- wall-mount transformer
- NI cable

Obtain the console and SLIP cables from your terminal and router vendor. See [Installation Checklist](#) on [page 2-2](#).

Notify both Osicom Communications' Customer Service Department (1-800-359-2273) and the transportation carrier *immediately* if there are any damages or shortages.

Save the cartons and foam inserts in case the unit must be shipped at a later date.

2.2 Installation Checklist

1. Prepare the site, including provision of a dedicated power outlet.
 2. Verify that common carrier or customer-supplied line is installed.
 3. Obtain the console/SLIP management cables from your terminal vendor and router (or terminal server) supplier.
 - The console cable should be a terminal-to-async modem cable type.
 - If your router's SLIP cable is designed to attach to a modem, configure the Routermate's SLIP interface as a DCE (default setting).
 - If your router's SLIP cable is designed to attach to a terminal, configure the Routermate's SLIP interface as a DTE.
- See [SLIP Management](#) on [page 2-7](#) for information on configuring the SLIP interface.
4. Attach an ASCII terminal (see [Terminal Management](#) on [page 2-6](#)) and enter the configuration data for the Network, DTE, and SLIP interfaces.
 - Parameters for the NI and DTE connectors are on the Configuration Menu, page 3-10.
 - Parameters for the SLIP port are on the Management Menu, page 3-15.

2.2.1 Communications Line Requirements for CSU/DSU

The communications facility between Routermate's should be a DDS or metallic baseband line with a wire gauge between 19 and 26 (inclusive). The Routermate will *not* operate on Dial Network (DDD) lines nor on voice-grade lines.

The baseband line must have the following characteristics:

- Metallic continuity
- Non-switched
- Two twisted pairs
- Must not be equipped with correcting circuits, repeaters, or loading coils

We recommend that you use two separate twisted-pair cables. In noisy environments, use shielded twin cables that are grounded to your telecommunications facility.

A single multi-twisted-pair bulk cable may be used. In this case, ensure that transmit and receive wires are on separate twisted pairs.

2.3 FCC Part 68 Requirements for CSU/DSU

Notification to the Telephone Company

The Routermate 56 complies with Part 68 of FCC Rules. You must provide the 14-character FCC Registration Number (see [label](#) on underside of unit) plus the Facility Interface Codes (according to data transmission speed) and Service Order Code (see [front matter](#) of manual), to your telephone company so they can connect the necessary service.

Malfunction of the Equipment

In the event this equipment should fail to operate properly, disconnect the unit from the communications line until you learn whether the source of trouble is in your equipment or in the line. If the trouble appears to be with this unit, discontinue use of the unit until it is repaired.

Under FCC rules, no customer is authorized to repair this equipment. This restriction applies whether the equipment is in or out of warranty. You may contact the Osicom Communications Repair Department at 301-317-7400.

Please note that the telephone company may ask that you disconnect this equipment from their lines until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

Incidence of Harm

If your equipment causes harm to the network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible.

Rights of the Telephone Company

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted service.

2.4 LED Indicators

Eight LEDs on the front panel indicate DTE interface control signals, data, and test status.

DSR (Data Set Ready) Green LED lights when the Data Set Ready lead from the CSU/DSU is ON.

RTS (Request To Send) Green LED lights when the Request-to-Send lead from the DTE is ON; that is, the DTE wishes to transmit data.

CTS (Clear To Send) Green LED lights when the Clear-to-Send lead from the CSU/DSU is ON; the DTE may begin transmitting data.

DCD (Data Carrier Detect) Green LED lights when digital data signals are being received.

TXD (Transmit Data) Green LED lights when data is being sent from the DTE to the Routermate 56.

RXD (Receive Data) Green LED lights when data received from the remote unit is sent to the DTE. When self test is on, the Receive Data LED is normally OFF with no errors; and flashes on a data error.

TST (Test) Red LED lights when the Routermate 56 is in test mode.

NIS (Not In Service) Yellow LED lights when the unit is receiving an OOS (Out of Service) or OOF (Out of Frame) from the Telco; and also if no signal is detected.

2.5 Interfaces

Figure 2-1 shows the rear panel connectors.

- POWER – wall-mount transformer included
- NI (Network Interface) – RJ48S, 8-position modular jack; keyed
- DTE – V.35 (34-pin female)
- SLIP/CONSOLE – RS-232 (25-pin female)

NOTE

The SLIP/Console interface is configured by four internal jumpers; E1, E2, E3, and E4. See [Terminal Management, page 2-6](#).

Appendix A provides interface pin descriptions and cable illustrations. Appendix B lists order numbers for cables.

2.5.1 Power

The Routermate includes a 9 VAC, 1.0 amp wall-mount transformer. Refer to [Appendix C, Specifications](#), for power requirements.

To avoid possible errors due to potential difference between grounds for the CSU/DSU and for the DTE, the power receptacle for the CSU/DSU and DTE should be served from the same AC power source.

NOTE

Use only the wall-mount transformer included with the unit. See the [Multipurpose label](#) on the underside of the unit for the part number.

2.5.2 Network Interface

The Network Interface (NI) connects the Routermate to the DDS facility. The NI connector is an 8-pin keyed modular jack. The connection between the CSU/DSU and the network consists of 4 leads, divided into a Transmit (TX) and Receive (RX) pair.

Use cable 115-0414-004, included with the unit, to connect the NI interface on the rear panel to the RJ48S Telco jack. See [Appendix A](#) for interface pin assignments.

Access the [Configuration Menu](#) (see [page 3-10](#)) and configure the *Speed* to match the speed of the line supplied by the carrier.

2.5.3 DTE Interface

Use the V.35 connector with the appropriate cable to connect the Routermate 56 to your DTE.

See [Appendix A](#) for interface pin assignments.

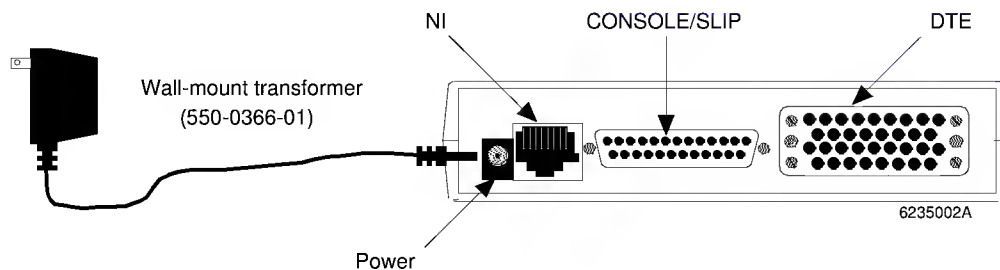


Figure 2-1. Rear Panel Connectors

2.5.4 Console/SLIP Interface

The **Console/SLIP** interface is an RS-232 connector. It provides a connection for the following management options:

- Terminal operation of management screens
- Telnet connection to management screens
- SNMP management

For terminal operation, an ASCII terminal is connected to the **Console/SLIP** interface. Use the terminal to access management screens for configuring, testing, and monitoring the status of the Routermate. See *Terminal Management* on page 2-6.

The **Console/SLIP** interface also provides a Serial Line Internet Protocol (SLIP) port for implementing SNMP management or a Telnet connection to the management screens (see *SLIP Management*, page 2-7).

SNMP management and a Telnet connection to the management screens can be implemented simultaneously. The Telnet connection can be enabled or disabled with the **Access via Telnet** parameter (see *Management Menu*, page 3-15).

Jumpers on the internal circuit card are used to configure the **Console/SLIP** interface for either terminal or SLIP operation (see *Terminal Management*, page 2-6).

2.6 Terminal Management

An ASCII terminal is used for initial software configuration and can also be used to manage the Routermate.

Jumpers on the internal circuit card are used to configure the **Console/SLIP** interface, as shown in Figure 2-2.

Jumpers **E1**, **E2**, and **E4** configure the **Console/SLIP** interface for DTE or DCE operation. All jumpers must be in the same position.

- Jumper 1-2 = DCE (default); the port will be connected to a DTE (terminal).
- Jumper 2-3 = DTE; the port will be connected to a DCE (modem).

Jumper **E3** configures the Console/SLIP interface as follows:

- Jumper In = Software selection of either Terminal or SLIP operation (default).
- Jumper Out = Terminal operation only.

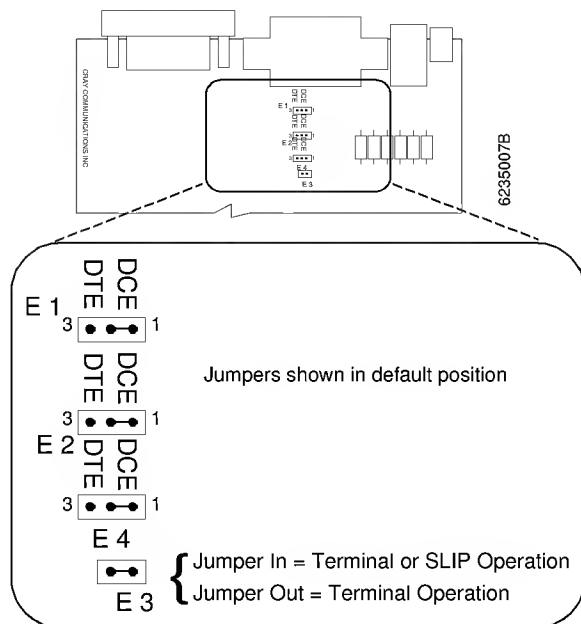


Figure 2-2. Configuring the Console/SLIP Interface

WARNING!

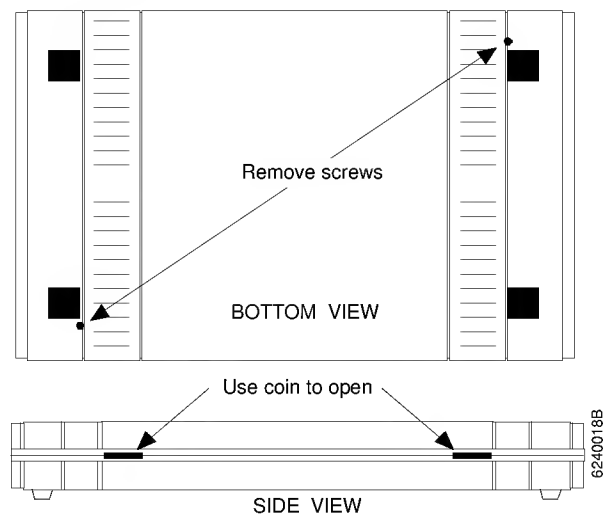
Disconnect power before opening the enclosure.

To access the jumpers:

1. Remove the two screws on the bottom of the unit.
2. Gently pry open the enclosure (a coin will work).

NOTE

When re-assembling the enclosure, be careful not to over-tighten the screws.



To access the management screens:

1. Connect a straight-through RS-232 cable from the **Console/SLIP** interface to the ASCII terminal.
2. Turn on the terminal and set its transmission options:
 - Rate: 9600 bps
 - Mode: full duplex
 - Character: 8 bits
 - Parity: none
 - Stop bits: 1
 - Flow control: DC1/DC3 (Xon/Xoff)

The Routermate's **Console/SLIP** interface is fixed at 9600 bps, 8 character bits, 1 stop bit, and no parity.

You are now ready to manage the Routermate from a terminal. The *Console Mode* option on the Unit Menu (page 3-12) defaults to Terminal.

2.7 SLIP Management

The Routermate implements Serial Line Internet Protocol (SLIP), which enables SNMP and Telnet Management over a standard RS-232 interface. SNMP traffic and traffic from a single Telnet connection can pass simultaneously.

2.7.1 SNMP/Telnet Installation

To manage the Routermate from an SNMP station or via a Telnet connection, perform the following steps:

1. Access the Management Menu (page 3-15) and configure SNMP and Telnet management parameters.
 - For both Telnet and SNMP applications, assign an IP address to the Routermate.
 - Before Telnet management can be used, set the Access via telnet parameter to *Enabled*.
 - Before SNMP management can be used, configure the SNMP R/O and R/W Community strings to match the strings used by the SNMP management station.
2. After you configure the parameters above, go to the Unit Menu and change the *Console Mode* option to SLIP. When you change this option, the following prompt appears when you exit the menu:

Must restart to install new Console Mode.

Access the System Restart screen and perform a software restart or power cycle the unit.

3. Configure the **Console/SLIP** interface jumpers for SLIP operation as described on page 2-6.

If your router's SLIP cable is designed to attach to a modem, configure the Routermate's SLIP interface as a DCE (default setting).

If your router's SLIP cable is designed to attach to a terminal, configure the Routermate's SLIP interface as a DTE.

4. Connect SLIP cable. Connect a cable from the **Console/SLIP** interface to an auxiliary asynchronous interface of a router or terminal server. Ensure that the auxiliary asynchronous port on the router or terminal server is set to 9600 bps, 8 character bits, 1 stop bit, and no parity; which is the fixed configuration of the Routermate's **Console/SLIP** interface.

Figure 2-3 shows the cables and adapters required to connect a Routermate 56 to the AUX port of a Cisco™ router. Order numbers for cables and adapters available from Osicom are in Appendix B.

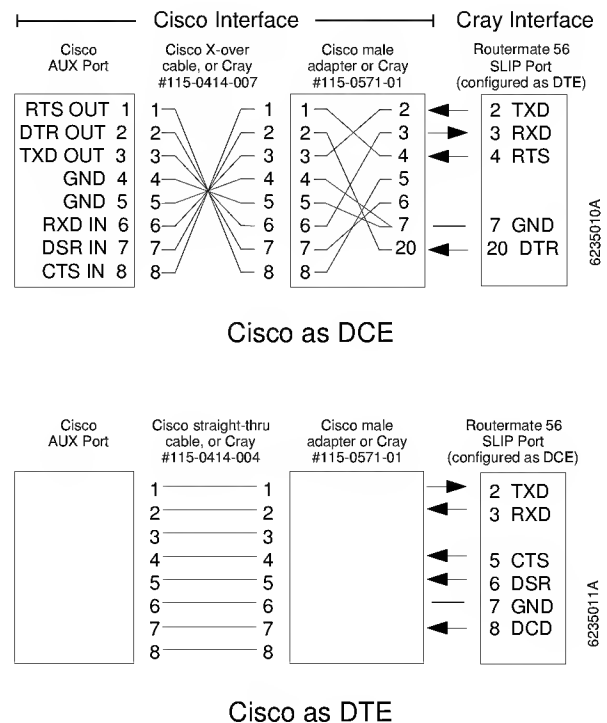


Figure 2-3. SLIP Connection to Cisco Router

2.8 Obtaining the Enterprise MIB

In SNMP applications, Osicom's enterprise MIB lets you take full advantage of the Routermate's management features from an SNMP workstation.

The enterprise MIB can be downloaded from Osicom's Web site at: *www.osicom.com*

TERMINAL OPERATION

This chapter illustrates the terminal screens and explains how to use the menus to configure and manage the Routermate 56, including the parameter options and descriptions.

3.1	Screen Structure	3-1
3.2	Keys and Conventions	3-2
3.3	Terminal Selection	3-3
3.4	Password	3-4
3.5	Main Menu	3-5
3.5.1	Screen Path	3-5
3.6	DSU Diagnostics	3-6
3.6.1	Loopback Tests	3-6
3.6.2	Telco Loopback Tests	3-9
3.6.3	Statistics	3-9
3.6.4	Line Status	3-9
3.6.5	Control Lead Status	3-9
3.7	Configuration Menu	3-10
3.8	Unit Menu	3-12
3.8.1	System Restart	3-13
3.8.2	Service Information	3-14
3.9	Management Menu	3-15
3.10	SNMP Trap Client Table	3-17

3.1 Screen Structure

Figure 3-1 illustrates the screen structure for the terminal management screens.

Brief descriptions of the menus are provided below.

Main Menu – top level menu from which all subsequent menus are selected.

DSU Diagnostics – initiate and monitor diagnostic tests and monitor statistics and line status.

Configuration – configure parameters for the network and DTE interfaces.

Unit – set the unit's inactivity timeout, password, and Console Mode (Terminal or SLIP). You can also create or change the headers on the screens and access the System Restart and Service Information screens.

Management – configure parameters for SNMP and Telnet management.

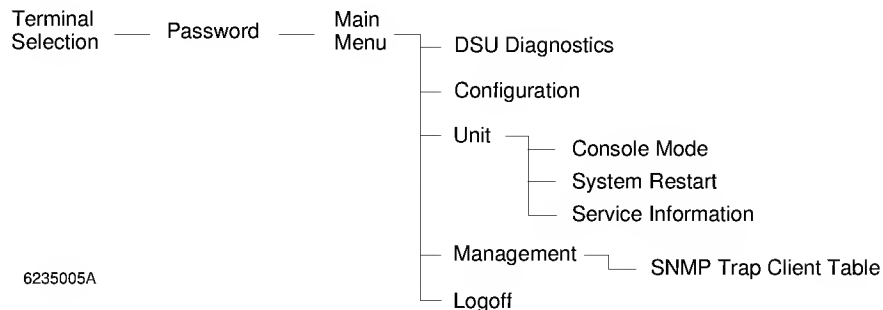


Figure 3-1. Screen Structure

3.2 Keys and Conventions

Prompts at the bottom of each screen instruct the user which keys to use to:

- Position the cursor
- Edit parameters
- Execute commands
- Access other screens

Table 3-1 summarizes the most frequently used keys.

Edit Fields

To configure a parameter by typing a value:

- Press **[CR]** to highlight the field.
- Type the value.
- Press **[CR]** again to exit the field.

To restore the parameter to its original contents, press **[Esc]** before exiting the field.

To edit existing text in a field that can be edited:

- Move the cursor to the field and press **[Ctrl-E]** to highlight the field.
- Use the arrow keys to move the cursor within the field.
- Type over the existing information.
- Press **[CR]** to exit the field.

To delete existing text from a field that can be edited:

- Move the cursor to the field and press **[CR]**.
- Press **[Space Bar]**.
- Press **[CR]** again.

Selecting from multiple options

- Move the cursor to the parameter.
- Press **[CR]** to toggle/scroll through the available options.
- When the desired option is displayed, either move the cursor to the next parameter using **[Space Bar]** or **[Backspace]**, or exit the screen.

To restore the parameter to its original contents, press **[Esc]** before exiting the field.

Saving Changes

Press **[X]** to exit from a screen. If you have modified any parameter, you are prompted:

Confirm this configuration?
☐ No ☐ Yes

Select *No* to exit the current screen without saving the changes; select *Yes* to save the changes and exit.

Table 3-1. Frequently Used Keys	
KEY	FUNCTION
Move Around in Screens	
[Space Bar]	cursor down
[Back Space]	cursor up
[Ctrl-N]	Terminal Selection screen
[Ctrl-O]	re-draw screen
[Ctrl-T]	return to Main Menu *
[X]	exit to previous screen
Type an Entry	
[CR]	select field
[Back Space]	delete character left
[Esc]	restore original setting
[Ctrl-E]	highlight field, edit text
[CR][Space Bar][CR]	delete current contents
Select From List	
[CR]	scroll/toggle through list
[Esc]	restore edited field to its original setting
[Space Bar]	move to next field
* [Ctrl-T] returns to the Main Menu <u>without</u> prompting to confirm configuration changes.	

Certain prompts will change to correspond to the function or operation. An example is shown below.

FUNCTION/OPERATION	PROMPT
Edit an entry	Edit Field = [CR]
Select from multiple options	Scroll Through Options = [CR]
Select another menu	Select Menu = [CR]

3.3 Terminal Selection

To configure the Routermate, connect a terminal to the rear-panel RS-232 interface as described on page 2-6.

Configure the terminal for:

- Rate: 9600 bps
- Mode: full duplex
- Character: 8 bits
- Parity: none
- Stop bits: 1
 - Flow control: DC1/DC3 (Xon/Xoff)

The Routermate's RS-232 interface is fixed at 9600 bps, 8 character bits, 1 stop bit, and no parity.

NOTE

Internal jumper E3 must be inserted for terminal operation (see [page 2-6](#)).

When the unit is turned on, there is a brief delay as internal diagnostics run automatically. Then the Terminal Selection screen appears (Figure 3-2).

If the Terminal Selection screen does not appear, press **[Ctrl-N]**.

Type the letter for the type of terminal that is connected to the unit:

- (A) ANSI 3.64
(B) DEC VT100
(C) PC ANSI
(D) IBM 310I
(E) DEC VT52
(F) Televideo 910

If the terminal displays garbled characters after the terminal type is selected, press **[CTRL-N]** to return to the Terminal Selection screen, where you can select a different terminal type.

Telnet: When a Telnet connection is used to access the management screens, the terminal type usually can be determined automatically. If not, the Terminal Selection screen is displayed. The user has three attempts or 30 seconds to enter the password before the session is disconnected.

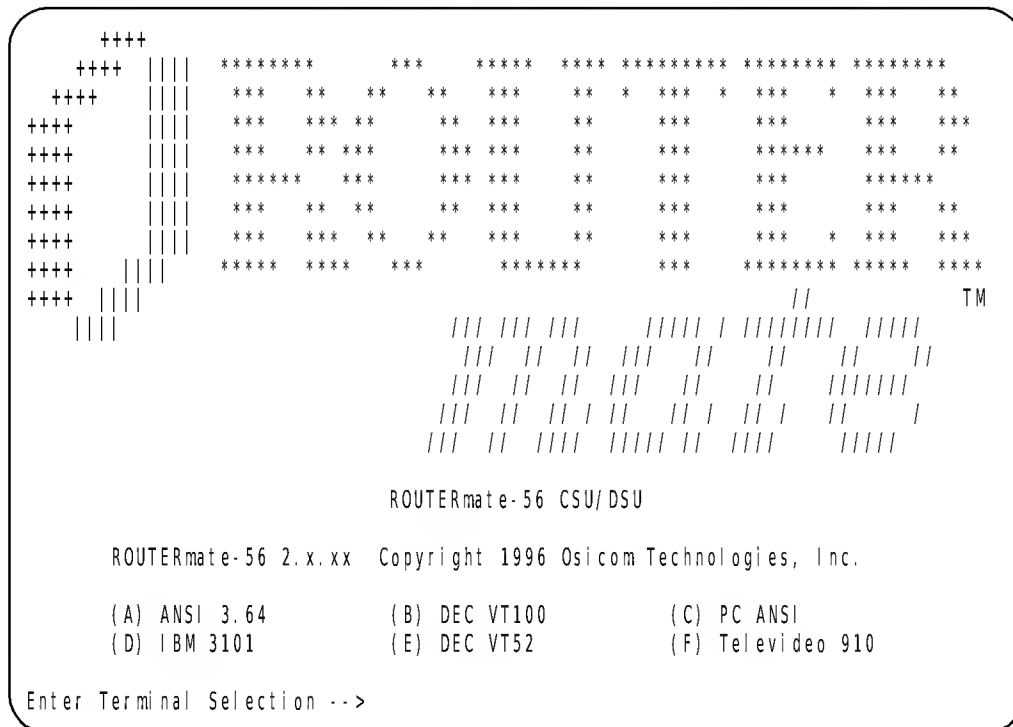


Figure 3-2. Terminal Selection Screen

3.4 Password

The management screens are password protected. A password prompt appears after a terminal type is selected (Figure 3-3).

To access the Main Menu, type the password and press **[CR]**.

If no password has been configured, simply press **[CR]**, which is the default password.

Configure the password at the Unit Menu (page 3-12).

Telnet: The Telnet user has thirty seconds from the time the Telnet session is connected to enter the password, or the session is disconnected.

Screen Path

Enter Terminal



Enter Password

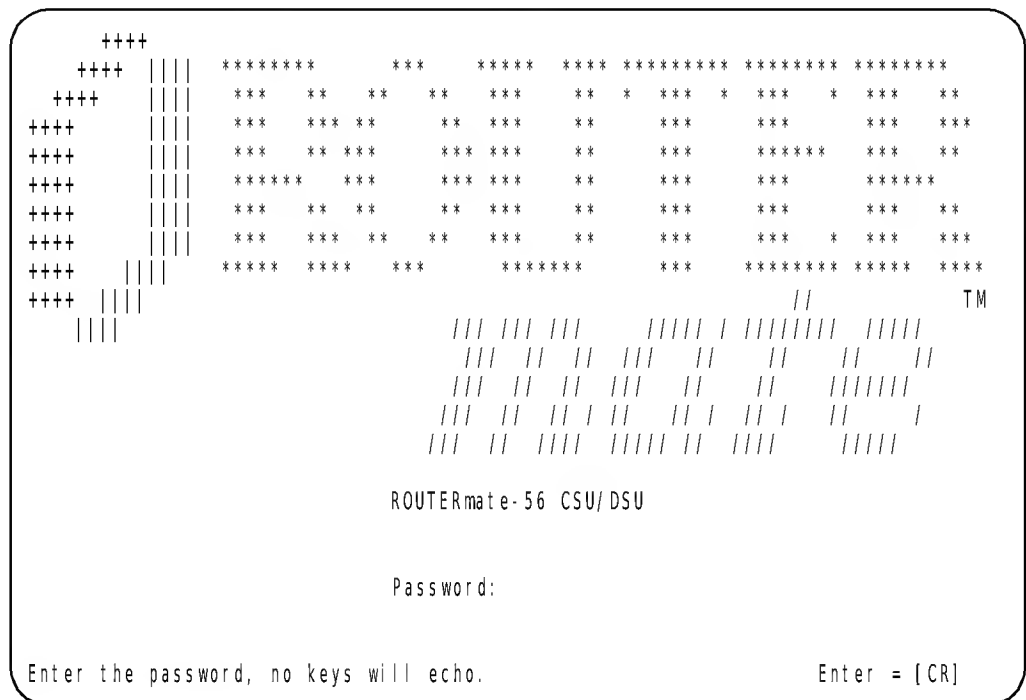


Figure 3-3. Password Screen

3.5 Main Menu

The Main Menu (Figure 3-4) is displayed after the password is entered.

To make a selection from the Main Menu, press **[Space Bar]** or **[Backspace]** to position the cursor on the desired choice; then press **[CR]**.

Logoff

When you select Logoff from the Main Menu, the Terminal Selection screen is displayed.

To access the management screens after logging off, select a terminal type and then enter the password. The default password is **[CR]**.

Telnet: Selecting Logoff disconnects the Telnet connection.

3.5.1 Screen Path

To help the user navigate through the menus and screens, a **Screen Path** is illustrated next to each screen. Screen names are inside boxes. Commands and on-screen selections that lead to a screen are written in *italics*.

In the example below: at the Terminal Selection screen, enter the terminal selection **[A - F]** to display the Password screen. Enter the password to display the Main Menu.

NOTE

All terminal screens reflect default parameters.

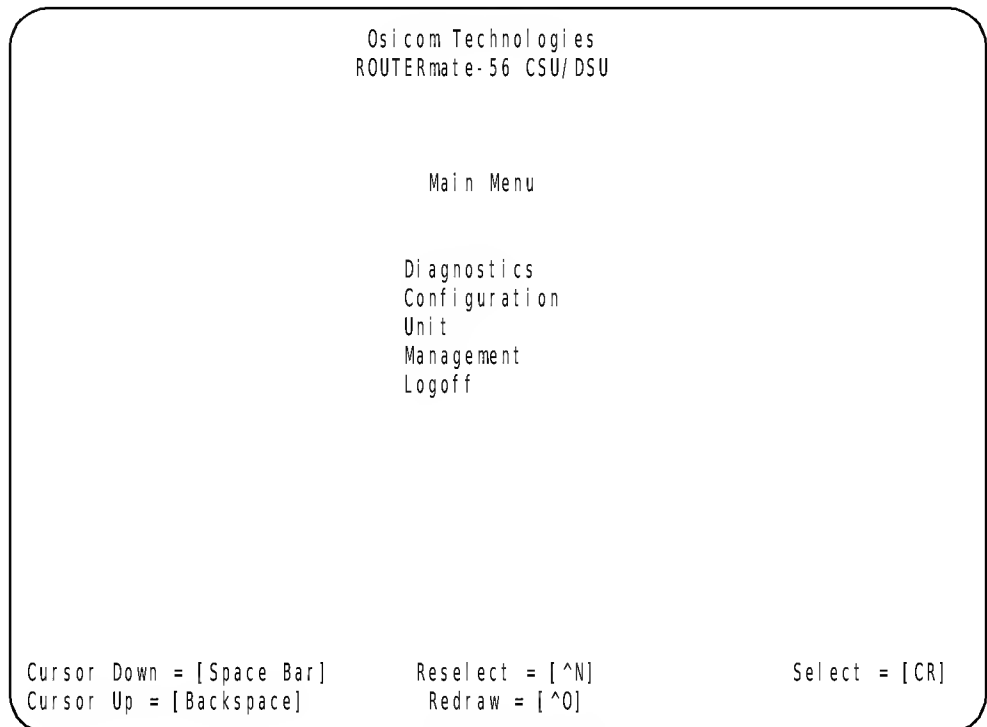
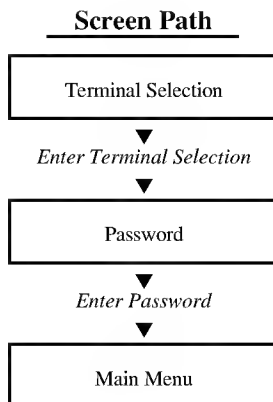


Figure 3-4. Main Menu

3.6 DSU Diagnostics

The DSU Diagnostics Menu (Figure 3-5) lets you initiate loopback tests, monitor statistics, and observe control lead indicators.

To start a loopback, follow the key prompts at the bottom of the screen.

1. Position the cursor on the desired test.
2. Press **[CR]** to activate the selection. Within 5 seconds, the TM (Test Mode) status indicator displays *On* to indicate the test is in progress.
3. Press **[CR]** to turn off the test.

3.6.1 Loopback Tests

Controls and Indicators

For each loop test, there is a Control and an Indicator.

On or *Off* (Control) – indicates whether or not a loop command has been selected.

Yes or *No* (Indicator) – indicates whether or not the unit has responded to the loop command.

Selftest

The CSU/DSU is equipped with a test pattern generator/comparator that can be conditioned to send a test pattern out the network interface. The test pattern generated is a pseudorandom 511 pattern.

The selftest can be used with an external test set connected to a CSU/DSU at the other end of the DDS line. When the test set sends the 511 pattern to the CSU/DSU, the received pattern is checked for errors. If an error is detected, the front panel RXD (Receive Data) LED flashes.

NOTE

When both the local and remote units generate selftest (no other tests enabled), ignore initial errors caused by synchronization of test activation. Clear these errors by pressing **[C]**.

The selftest can be combined with Local Loop and Remote Digital Loop.

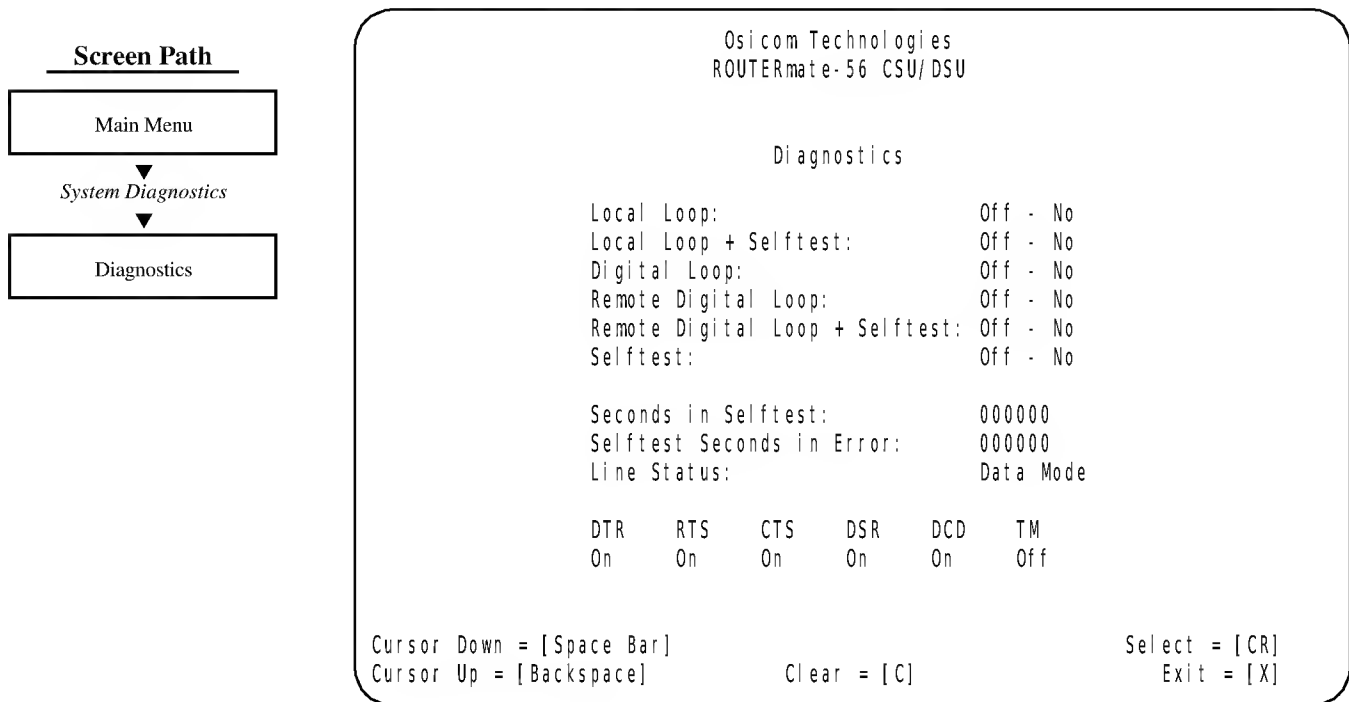


Figure 3-5. DSU Diagnostics Menu

Local Loop

Local Loop (Figure 3-6) is a unidirectional loopback of the CSU/DSU line transmit and receive pairs. Data transmitted into the DTE interface on TXD is sent through the unit, looped back inside the unit; then sent back to the DTE interface and output on RXD.

A test set or other device can be used to transmit data through the unit and compare the transmitted data with the received data. Local Loop tests the local DSU and the DSU DTE interface. This test can also be controlled from the DTE interface. This test is compliant with CCITT recommendation V.54, loop 3.

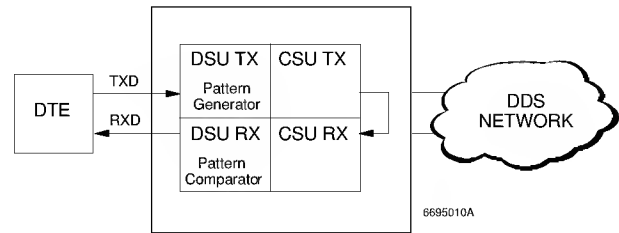
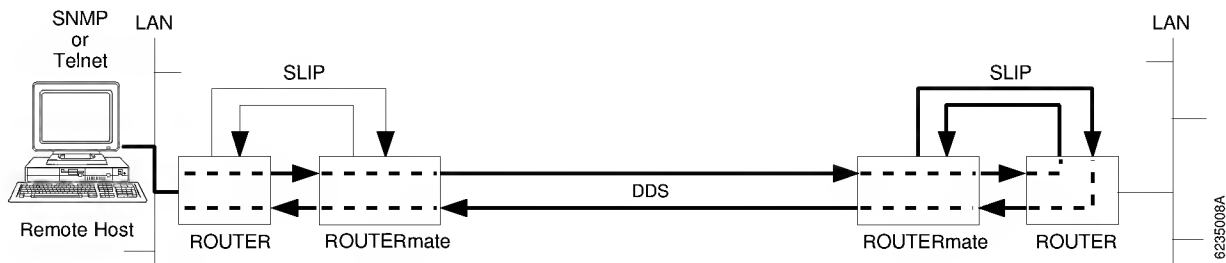


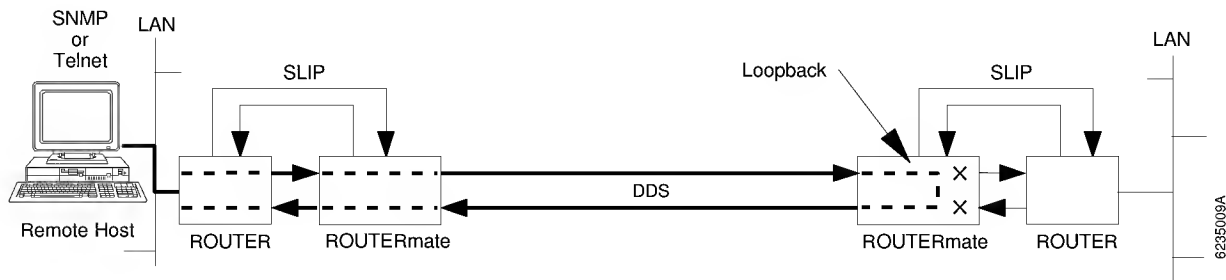
Figure 3-6. Local Loop

NOTE

If using SNMP or telnet management, initiating any diagnostic test from a host on a remote network will terminate communication with the unit if the path used to manage the unit is across the line to which the unit is attached. To resume communication in this instance, either turn off the test locally or reset the unit.



Remote Host SNMP and Telnet Management Path



Loopback Interrupts Management Path to Remote Unit

Local Loop + Selftest

This test uses the Local Loop and combines it with the internal test pattern generator/comparator as described in the [previous section](#). The unit sends its own test pattern through the unit and checks the looped data for errors. This test checks the local DSU.

NOTE

When the Line Status is either *OOS/OOF* or *Loss of Signal*, only Local Loop and Local Loop + Selftest can be performed.

Digital Loop

Digital Loop (Figure 3-7) is a unidirectional loop of the CSU/DSU. Data received from the network line is looped back at the local DSU DTE interface and retransmitted back down the network. This test checks the local DSU and the DDS line. The test pattern generator at the remote unit or an external test set connected to the remote unit can be used to transmit a test pattern and check for errors.

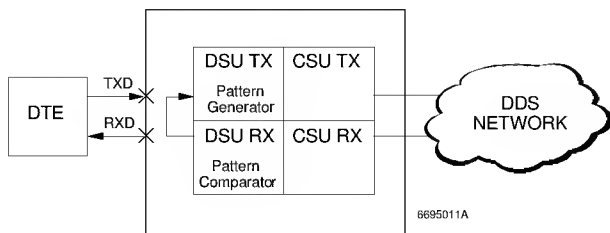


Figure 3-7. Digital Loop

Remote Digital Loop

Remote Digital Loop (Figure 3-8) is a coordinated test of both units on the network. The originating unit sends a signal to the remote unit which engages Digital Loop (see Digital Loop above). RDL tests both units and the DDS line. This test can also be controlled from the DTE interface. This test is compliant with CCITT recommendation V.54, loop 2.

Data transmitted from the local DTE is sent over the line and looped at the remote unit. The remote Routermate sends the data back to the local DTE.

NOTE

In an LDM (Limited Distance Modem) application, RDL must be initiated from the unit set to internal timing.

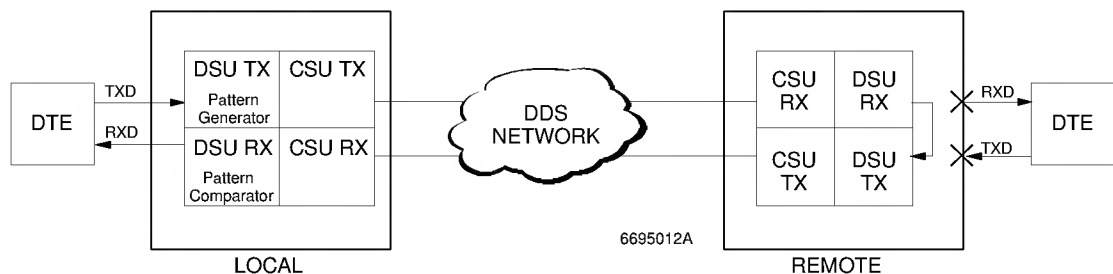


Figure 3-8. Remote Digital Loop

Remote Digital Loop With Selftest

This test uses the Remote Digital Loop and combines it with an internal test pattern generator/comparator. The unit sends its own test pattern through the unit and checks the looped data for errors. If an error is detected, the RXD LED flashes on the local unit. This test checks the local DSU, the DDS line, and the remote DSU.

NOTE

In an LDM application, RDL must be initiated from the unit set to internal timing.

3.6.2 Telco Loopback Tests

In addition to the loopback test capabilities built into the Routermate 56, there are two loopbacks that can be issued by the Telco at the request of the customer:

CSU Loopback : A reversal of the sealing current on the NI line causes a loopback through the CSU section of the unit.

DSU Loopback: An inband alternating byte pattern sent by the Telco causes a loopback similar to the Local Digital Loop to occur. The DTE interface is not placed into loopback.

3.6.3 Statistics

Seconds in Selftest - the length of time the selftest has been enabled. The count is cleared when you press [C] or another selftest is selected.

Selftest Seconds in Error - displays the number of seconds during which a selftest error was detected.

3.6.4 Line Status

One or more of the following CSU/DSU Line Status conditions can appear, depending on current operating mode.

Idle – The Routermate is receiving Control Mode Idle from the network.

Data Mode – The Routermate is receiving user's data from the remote unit.

Loss of Signal – No inbound signal is detected (32 cycles of all zeros will trigger this message).

OOS/OOF * – The Routermate is receiving the Out of Service or Out of Frame signal from the Telco.

CSU Loop * – This is a test initiated by the Telco at the user's request. A polarity reversal of the sealing current on the Telco line causes a loopback through the CSU section of the unit.

DSU Loop * – This is a test initiated by the Telco at your request. An inband test pattern sent by the Telco causes a loopback similar to the Digital Loop to occur.

NOTE

* These status conditions *only* occur on the DDS line; not when the Routermate is used as an LDM.

3.6.5 Control Lead Status

The following control leads on the V.35 interface indicate *On* or *Off*:

DTR – Data Terminal Ready
RTS – Request to Send
CTS – Clear to Send
DSR – Data Set Ready
DCD – Data Carrier Detect

The TM (Test Mode) indicator displays *On* when the Routermate is performing a diagnostic test.

3.7 Configuration Menu

The Configuration Menu (Figure 3-9) is used to program and display the parameters for the network and DTE interfaces.

To change configuration parameters:

1. Position the cursor on the desired parameter.
2. Press **[CR]** to scroll through the available options.

If you have made any changes to this menu, when you press **X** to exit, a confirmation box appears:

Confirm this configuration?

☐ No ☐ Yes

The default is No. Press **[CR]** or **N** if you do not want to save your changes.

If you do want to save the changes, press **Y**.

Speed - sets the speed for both the NI and DTE interfaces.

Set it to match the speed of the line provided by the carrier.

2400, 4800, 9600, 19200, and 56000 bps

Timing - sets the timing for the network interface.

Internal – The Routermate provides both transmit and receive clocks.

Repeater – The Routermate frequency-locks its transmit clock to its receive clock. When the Routermate is attached to a DDS network, set both local and units to *Repeater*.

External – The Routermate accepts external transmit clock from the DTE and provides receive clock.

If you are using the Routermate as an LDM, there must be a source for the data clock. This source can be the Routermate (Internal timing) or a DTE (External timing). Typically, the other end is set for Repeater timing; however, it may also be set to Internal or External timing. In LDM mode, never set both ends to Repeater timing.

Respond to RDL - controls the ability to **respond** to RDL, not the ability to **generate** the test.

On – allows the Routermate to respond to a remote digital loopback request from the remote end.

Off – prevents the Routermate from responding to a remote digital loopback request. The DSU still responds to Telco CSU and DSU loops when *Off* is selected.

CTS Control - determines how the CTS lead will function. It also controls whether the Routermate's transmitter will operate in switched or continuous carrier mode.

In switched carrier mode, the Routermate transmits *Data Mode* towards the network when the RTS lead is On, and transmits *Idle* when the RTS lead is Off. The remote unit switches its RLSD (DCD) lead On when it receives *Data Mode* from network and switches RLSD Off when receiving *Idle*.

In continuous carrier mode, the Routermate transmits *Data Mode* towards the network regardless of the state of the RTS lead. This causes the RLSD lead on the remote unit to be always On.

Follow RTS (switched carrier) – Clear to Send follows Request to Send.

Forced On (continuous carrier) – Clear to Send always On.

Follow RLSD (continuous carrier) - the CTS lead follows the state of the RLSD (DCD) lead.

When control mode idle is received, both the RLSD and CTS leads turn Off.

Follow RLSD/RTS (switched carrier) - this parameter (circuit

assurance) causes CTS to be On if *both* the CTS timing delay has expired and RLSD is On. If RLSD is Off, CTS will also turn Off, but the Routermate will not transmit the control idle code until the RTS signal goes Off.

NOTE

If you set CTS Control to either *Follow RLSD* or *Follow RLSD/RTS*, the RTS lead from the DTE must be on when performing any diagnostic test.

The following DSR control options let you control the response of Data Set Ready with respect to certain conditions.

DSR Off In NIS

Yes - causes the DSR signal to turn OFF when the Routermate receives a Not in Service signal, such as OOS (Out of Service) or OOF (Out of Frame).

No - yields a constant DSR ON signal unless one or more of the other DSR OFF parameters have been chosen.

DSR Off DL

Yes - causes the DSR signal to turn OFF when the Routermate has been placed into a digital loop test.

No - yields a constant DSR ON signal unless one or more of the other DSR OFF parameters have been chosen.

DSR Off LL/RDL

Yes - causes the DSR signal to turn OFF when the Routermate has been placed into a local loop or remote digital loop (initiating end).

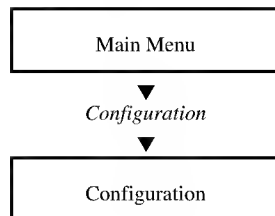
No - yields a constant DSR ON signal unless one or more of the other DSR OFF parameters have been chosen.

DSR Follow DTR

Yes - causes the Routermate's DSR signal to switch with the DTE's DTR signal.

No - yields a constant DSR ON signal unless one or more of the other DSR OFF parameters have been chosen.

Screen Path



Osicom Technologies
ROUTERmate-56 CSU/DSU

Configuration

Speed:	56000
Timing:	Repeater
Respond to RDL:	Enabled
CTS Control:	Follows RTS
DSR Off In NIS:	No
DSR Off DL:	Yes
DSR Off LL/RDL:	No
DSR Follow DTR:	No

Cursor Down = [Space Bar]
Cursor Up = [Backspace]

Scroll Through Options = [CR]
Exit = [X]

Figure 3-9. Configuration Menu

3.8 Unit Menu

The Unit Menu (Figure 3-10) contains supervisory and Routermate control information.

If you have made any changes to this menu, when you press **X** to exit, a confirmation box appears:

Confirm this configuration?

No **Yes**

The default is No. Press **[CR]** or **N** if you do not want to save your changes. If you do want to save the changes, press **Y**.

Header Line 1 - replace or modify the header appearing at the top of each menu. To do so:

1. Place the cursor at the Header Line 1 field and press **[CR]**; the cursor automatically positions itself at the header on the top of the menu.
2. Enter the new header, followed by a **[CR]**.

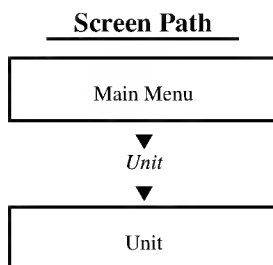
The new header is displayed after you confirm the configuration and exit the screen.

Header Line 2 - replace or modify the header appearing on line 2. Set this option the same way as instructed for Header 1.

Inactivity Timeout - specifies the time that elapses before the console is deactivated, or the Telnet connection is disconnected. If there is no keyboard activity during the specified time, the console is deactivated and access is restricted to users who enter the password. This security feature reduces the opportunity for unauthorized access to the management screens.

Position the cursor on the field and press **[CR]**; type the hours and minutes in *hh:mm* format. You do not need to type the colon.

The maximum time is 23:59. Set the time to 00:00 to disable this feature.



Osicom Technologies
 ROUTERmate-56 CSU/DSU

Unit

Header Line 1: Osicom Technologies
 Header Line 2: ROUTERmate-56 CSU/DSU
 Inactivity Timeout: 00:05 (hh:mm)
 Password:
 Console Mode: Terminal
 System Restart: >>
 Service Information: >>

Firmware Version: 2.0.00

Cursor Down = [Space Bar]
 Cursor Up = [Backspace]

Select = [CR]
 Exit = [X]

Figure 3-10. Unit Menu

Password - set your own password. A password can consist of eight characters or less. Once the password is set, the Logoff function in the Main Menu prevents unauthorized access to the menus.

To set the password:

1. At the Password field, press **[CR]**. The cursor automatically positions itself to the right of the Password field and the following prompt will appear on the screen:

Enter a password

2. Enter a password. The password will appear on the screen as it is typed.
3. Press **[CR]** to submit the password. The password changes to asterisks and the prompt disappears.

Console Mode - select the mode of operation for the Console/SLIP port.

Terminal - permits access via an ASCII terminal.
SLIP - permits SNMP and Telnet management.

If you change this option, the following prompt appears when you exit the menu:

Must restart to install new Console Mode.

Access the System Restart screen and perform a software restart or power cycle the unit.

NOTE

E3 must be inserted (default) to enable this option.

Firmware Version - identifies the revision level of the firmware installed in the Routermate.

3.8.1 System Restart

The System Restart menu (Figure 3-11) supports two types of restarts.

Software Restart - equivalent to powering the Routermate 56 off and on. Configuration parameters are not affected.

Defaults Restart - select this option to change configuration parameters on all menus to their default values.

NOTE

If Defaults Restart is selected, an active Telnet will be closed. You must re-enter the IP address from a local terminal, then set the *Console Mode* to SLIP before another Telnet connection can be made.

Screen Path

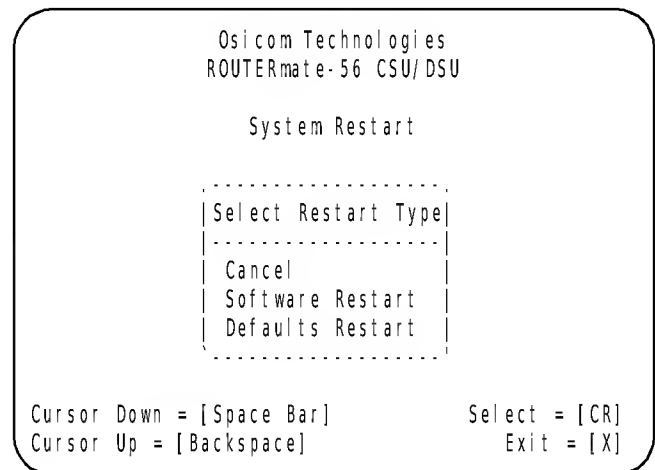
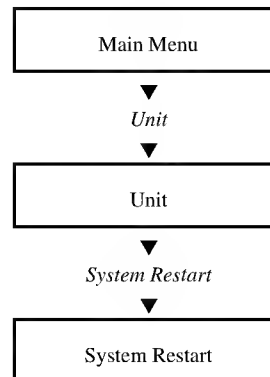


Figure 3-11. System Restart Menu

3.8.2 Service Information

Access the Service Information screen (Figure 3-12) from the Unit Menu. View telephone, fax, e-mail, and web site numbers for contacting service personnel.

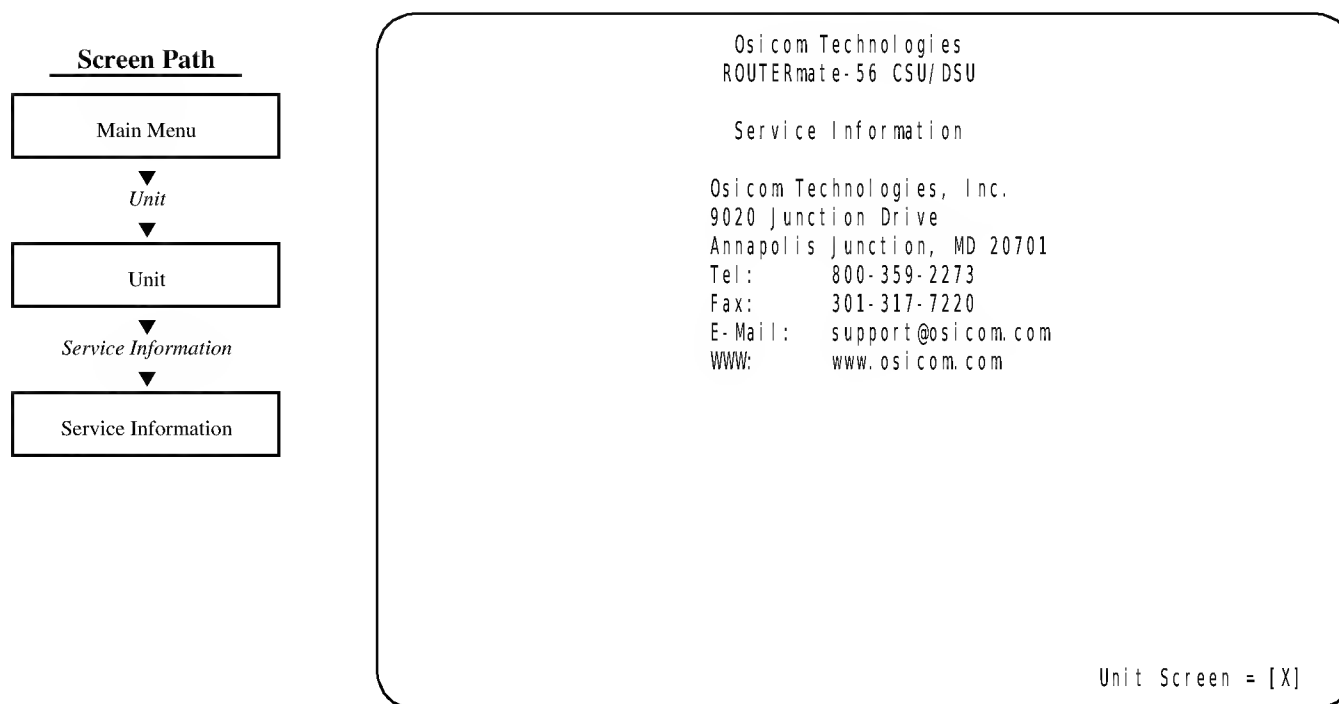


Figure 3-12. Service Information Screen

3.9 Management Menu

The Management menu (Figure 3-13) is used to configure management parameters for SNMP and Telnet operation.

If you have made any changes to this menu, when you press **X** to exit, a confirmation box appears:

```

Confirm this configuration?
No Yes
  
```

The default is No. Press **[CR]** or **N** if you do not want to save your changes. If you do want to save the changes, press **Y**.

Select SNMP Trap Client Table to display the SNMP Trap Client Table screen.

NOTE

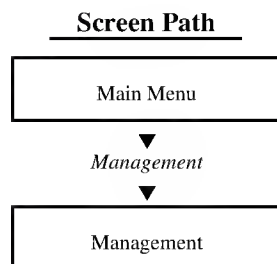
Internal jumper E3 must be inserted for SLIP (SNMP or Telnet) operation (see [page 2-6](#)). This is the default setting.

Internet Address - the IP (Internet Protocol) address that is assigned to the Routermate 56. Position the cursor on the field and press **[CR]**. Enter a decimal value and press **[CR]** again.

NOTE

You must assign a unique IP address to the Routermate's Console/SLIP interface to allow SNMP or Telnet management.

Subnet Mask - a subnet mask is not required for the Routermate 56 to operate. It is suggested, however, you enter the same subnet mask as the router or terminal server to which the Routermate is attached.



```

Osicom Technologies
ROUTERmate-56 CSU/DSU

Management

Internet Address:      0.0.0.0
Subnet Mask:          0.0.0.0

Access via telnet:     Enabled
SNMP R/O Community:   public
SNMP R/W Community:   private
Authentication Traps:  Enabled
Auto Learn Clients:    Enabled
SLIP Max Trans Unit:   296

SNMP Trap Client Table: >>

Cursor Down = [Space Bar]
Cursor Up   = [Backspace]

Edit Field = [CR]
Exit       = [X]
  
```

Figure 3-13. Management Menu

Access via telnet - provides a security feature; if disabled, Telnet access of management screens is prevented. Select:

Enabled - Telnet access is permitted.

Disabled - Telnet access is prevented.

SNMP R/O Community - the community string used for read-only access to the Routermate 56's MIB (Management Information Base) objects. Position the cursor on the field and press **[CR]**; type the string and press **[CR]** again.

SNMP R/W Community - the community string used for read-write access to the Routermate 56's MIB objects. If this is set to the same value as the read-only string, write access is prevented. Position the cursor on the field and press **[CR]**; type the string and press **[CR]** again.

SNMP community strings are not included in the enterprise MIB; this is to prevent a user with read-only privileges from viewing the community strings.

Authentication Traps - enable/disable authentication traps sent by the router when an SNMP request is received with an invalid community string. A trap is an unsolicited alarm or event.

Enabled - allows alarm messages.

Disabled - prevents alarm messages.

Auto Learn Clients - for SNMP, determines whether the Routermate 56 automatically learns the IP addresses of SNMP management stations (clients) to whom SNMP traps are to be sent.

The settings are:

Enabled - the Routermate 56 learns the IP addresses of SNMP management stations from incoming messages and stores the addresses in the Routermate 56's client address table. When events occur, traps are sent to each address in the client address table.

The IP addresses of up to 16 SNMP management stations can be learned automatically. The Routermate 56 learns, on an ongoing basis, the IP addresses of the 16 most recent management stations to access the Routermate 56.

Disabled - the Routermate 56 does not learn the IP addresses of SNMP management stations. Traps are sent only to the IP addresses of any SNMP Trap Clients that are manually entered.

SLIP Max Trans Unit - the MTU (Maximum Transmission Unit) for the SNMP LINK interface. This length does not include the IP header, which is usually 20 bytes. The options are:

232, 296, 576, 1492, and 1500

Frames longer than the maximum packet size will be fragmented before transmission.

3.10 SNMP Trap Client Table

Select SNMP Trap Client Table at the Management screen to display the SNMP Trap Client Table (Figure 3-14).

A trap client is an SNMP management station to which SNMP traps are routed. A trap client is identified by configuring an IP address for each of up to sixteen SNMP management stations.

A trap, which is the SNMP term for an alarm or event, is unsolicited information from an SNMP agent to an SNMP management station. Traps are the only type of unsolicited data that is permitted with SNMP. A trap occurs only when a threshold within the agent is violated or when a major event occurs.

The following MIB-II traps are reported:

Link Up (refers to the NI interface)
Link Down (refers to the NI interface)
Warm start
Cold start
Authentication

To configure an address:

1. Position the cursor on an address field in the Client Address column and press **[CR]**.
2. Type the address using decimal numbers and separating each address segment with a decimal point.
3. Press **[CR]** to exit the field.

If you have made any changes to this menu, when you press **X** to exit, a confirmation box appears:

Confirm this configuration?

The default is No. Press **[CR]** or **N** if you do not want to save your changes. If you do want to save the changes, press **Y**.

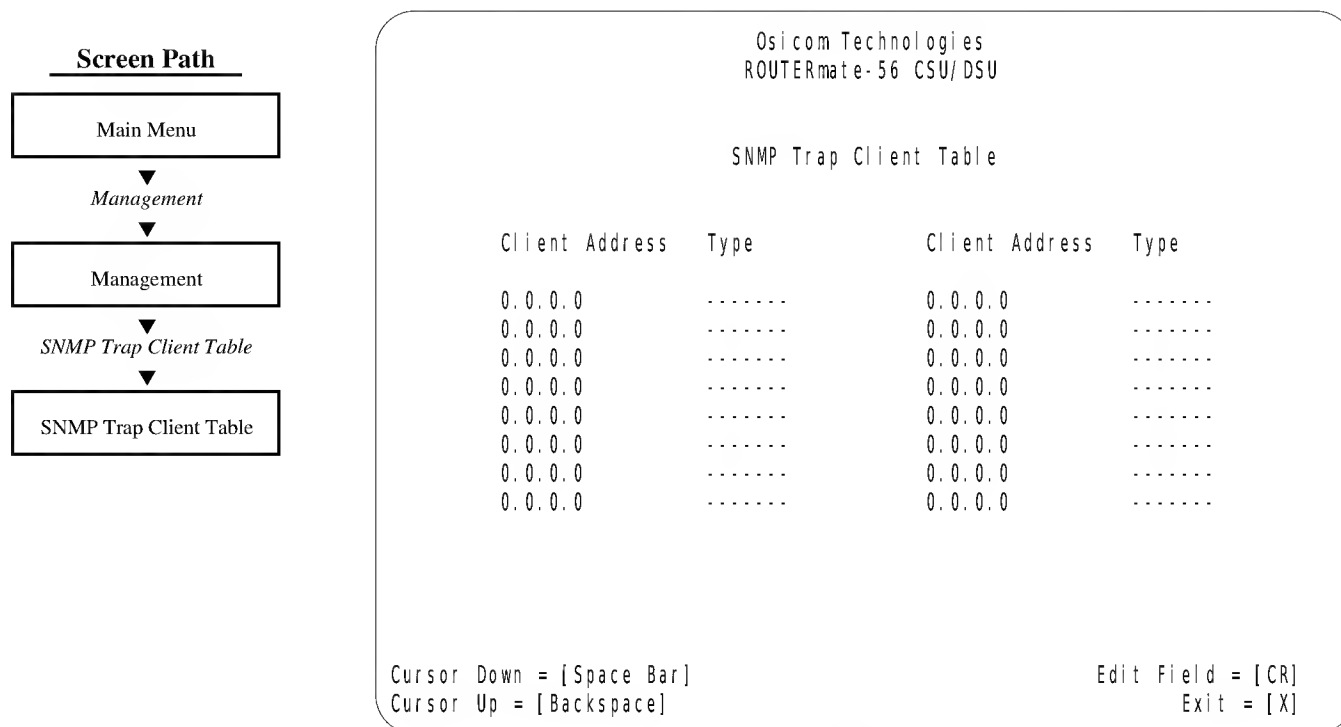


Figure 3-14. SNMP Trap Client Table

Client Address - the IP address for the SNMP management station to which SNMP traps are to be sent.

IP addresses are 32-bit numbers that are configured in 4-position, dotted decimal notation. To configure an address, move the cursor to an address field in the Client Address column and press **[CR]**. Type the address using decimal numbers and separating each address segment with a decimal point. Press **[CR]** to exit the field.

Type - identifies a trap client as one of the following:

Dynamic - The IP address for this trap client was learned automatically from an incoming SNMP message.

Static - The IP address for this trap client was configured manually.

----- - No address is assigned.

IP addresses for trap clients can be configured manually, or automatically learned.

For automatic address learning, see [Auto Learn Clients](#) on [page 3-16](#). Any addresses that are not entered manually can be learned automatically.

If it is desirable to limit the management stations to which traps are sent, the IP addresses for those management stations can be configured manually and the autolearn feature disabled. In this case, only those management stations whose IP addresses have been configured manually will receive traps from the Routermate 56.

4.1 Customer Support

Osicom Technologies offers a comprehensive range of customer support services, including technical assistance and maintenance agreements.

For technical assistance or detailed information about Osicom's support plans or pricing, call 1-800-DLX-CARE (1-800-359-2273) to reach a Customer Service Marketing Representative.

4.1.1 Canadian Customers

For technical assistance and service in Canada, contact the following authorized service center:

Novadyne Computer Systems, Inc.
97 Saramia Crescent, Unit 2
Concord (Toronto), Ontario L4K 4P7
Phone: 800-678-3399

4.2 Equipment Return and Repair

Corrective maintenance is limited to the testing and troubleshooting procedures provided in this manual. If, after contacting Customer Support, you are unable to correct any malfunction, please return the unit to Osicom Technologies for repair.

Prior to shipping the unit to Osicom Technologies for repair, call Product Repair at 301-317-7400 and request a Return Goods Authorization (RGA) number.

You may furnish information on defective units to Osicom Technologies by telephone. Please provide the following information:

- Unit part number and serial number
- Brief description of failure symptoms and cause
- Return shipping address (including sender's name)
- Preference of return shipping mode
- Invoice address
- Purchase Order number or letter of authorization for out of warranty units
- Person to contact for further information. Please include telephone number.

For the best equipment protection, use the original cartons and packaging material. Send the unit to:

Osicom Technologies, Inc.
9020 Junction Drive
Annapolis Junction, Maryland 20701

IMPORTANT

RGA number must appear on container!

Table A-1. SLIP/Console Interface, Configured as DTE (Connects to DCE)		
PIN	SIGNAL	DIRECTION
2	Transmit Data	Out
3	Receive Data	In
4	Request to Send	Out
7	Signal Ground	—
20	Data Terminal Ready	Out



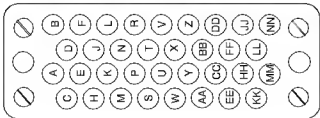
Table A-3. NI Interface		
PIN	SIGNAL	DIRECTION
1	Transmit	Out
2	Transmit	Out
3	Not used	—
4	Not used	—
5	Not used	—
6	Not used	—
7	Receive	In
8	Receive	In



Table A-2. SLIP/Console Interface, Configured as DCE (Connects to DTE)		
PIN	SIGNAL	DIRECTION
2	Transmit Data	In
3	Receive Data	Out
5	Clear to Send	Out
6	Data Set Ready	Out
7	Signal Ground	—
8	Carrier Detect	Out



Table A-4. V.35 Interface		
PIN	SIGNAL	DIRECTION
B	Signal Ground	—
C	Request to Send	In
D	Clear to Send	Out
E	Data Set Ready	Out
F	Data Carrier Detect	Out
H	Data Terminal Ready	In
P	Transmitted Data A	In
R	Received Data A	Out
S	Transmitted Data B	In
T	Received Data B	Out
U	Ext. Transmit Clock A	In
V	Receive Clock A	Out
W	Ext. Transmit Clock B	In
X	Receive Clock B	Out
Y	Transmit Clock A	Out
AA	Transmit Clock B	Out
NN	Test Mode	Out



NOTE

The default configuration for the SLIP/Console port is DCE and terminal operation. Jumper settings are discussed in [Terminal Management](#) on [page 2-6](#).

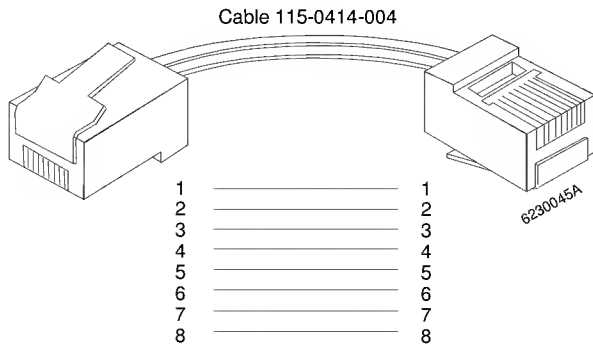


Figure A-1. Cable, Straight-thru (115-0414-004)

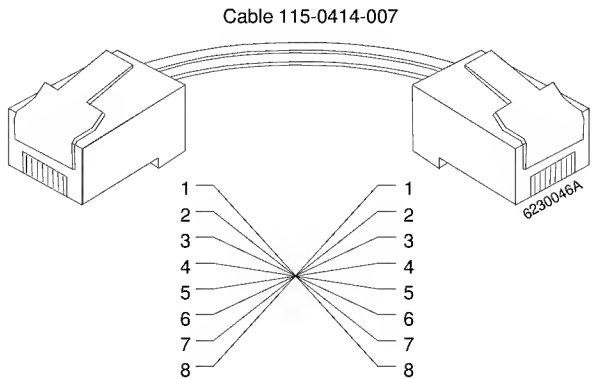


Figure A-2. Cable, Crossover (115-0414-007)

NOTE
Appendix B lists order numbers for these cables.

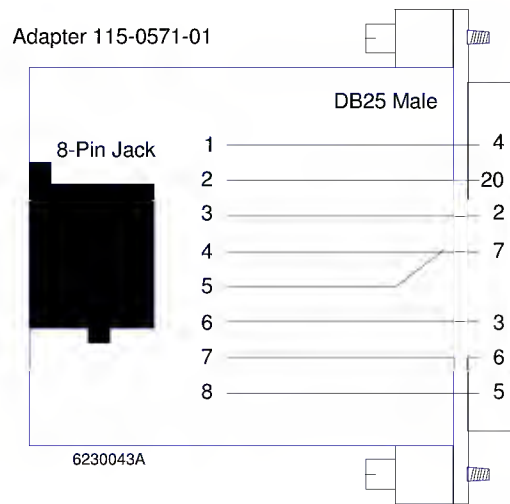


Figure A-3. Adapter, 8-pin Jack to DB25 Male (115-0571-01)

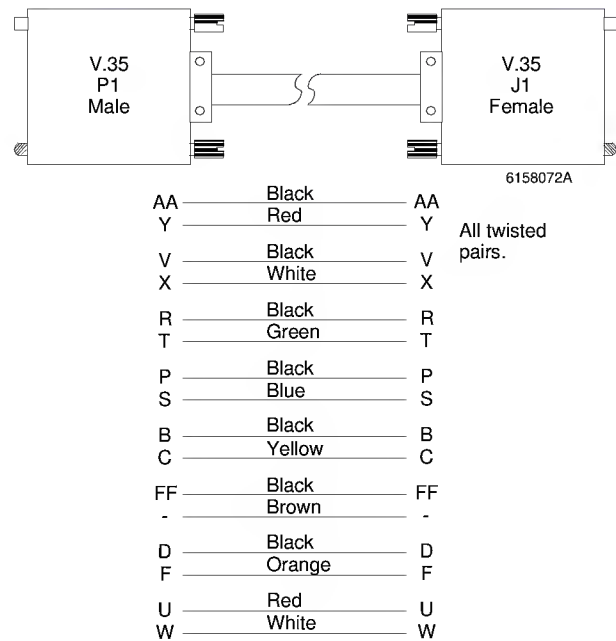


Figure A-4. Cable, V.35 Extension; Male-to-Female, Shielded (905-7177-XX)

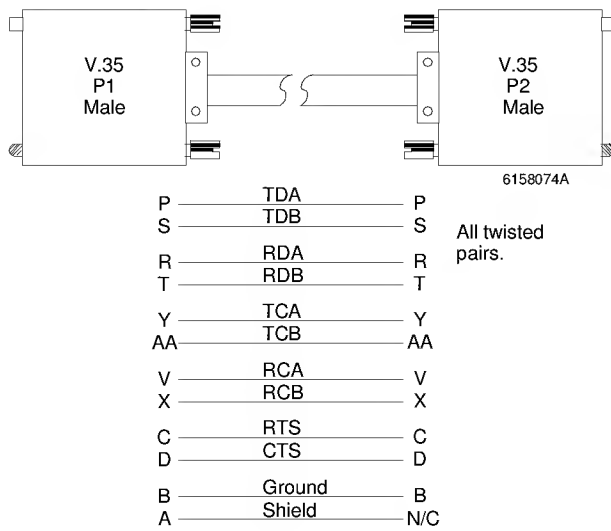


Figure A-5. Cable, V.35 Extension; Male-to-Male, Shielded (115-0537-01)

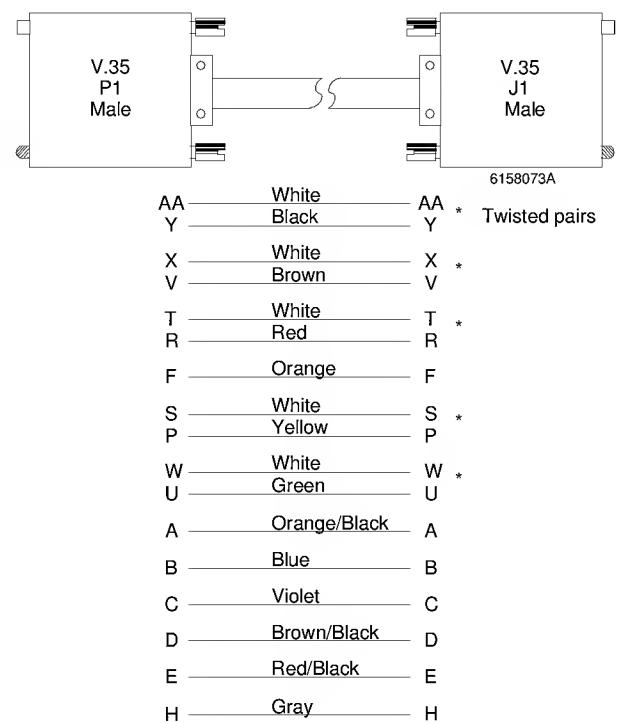


Figure A-6. Cable, V.35 Extension; Male-to-Male, Shielded (DCA9A51A/CBE9051X)

ORDERING INFORMATION

APPENDIX B

Table B-1. Routermate Ordering Information

DESCRIPTION	ORDER NUMBER
ROUTERmate 56K CSU/DSU (includes power transformer and network cable)	Routermate-56
Manual Routermate 56 CSU/DSU Installation and Operation	918-6235
Power Transformer	550-0366-01
Management Enterprise MIB written in standard ASN.1 notation	Free download from Osicom's web site at http://www.osicom.com

Table B-2. Cable and Adapter Ordering Information

DESCRIPTION	PART NUMBER	ORDER NUMBER
Cable, straight-thru (see Figure A-1)	115-0414-004	CBE04144 (7 ft)
Cable, crossover (see Figure A-2)	115-0414-007	CBE04147 (6 ft)
Adapter, 8-pin jack to DB25 male (see Figure A-3)	115-0571-01	CBE73001
V.35 extension; male-to-female, shielded (see Figure A-4)	905-7177-01 905-7177-02 905-7177-03 905-7177-04 905-7177-05	CBE71771 (10 ft) CBE71772 (25 ft) CBE71773 (50 ft) CBE71774 (2 ft) CBE71775 (5 ft)
V.35 extension; male-to-male, shielded (see Figure A-5)	115-0537-01	CBE05371 (18 in)
V.35 extension; male-to-male, shielded (see Figure A-6)	DCA9A51A CBE90511 CBE90512 CBE90513 CBE90514	CBE9051 (15 ft) CBE90511 (25 ft) CBE90512 (50 ft) CBE90513 (75 ft) CBE90514 (100 ft)

Table C-1. Routermate 56 CSU/DSU Specifications	
ITEM	SPECIFICATION
Operating Modes	DDS and Limited Distance Line Driver (point-to-point and multi-point)
Data Transmission Speeds	2400, 4800, 9600, 19200, 56,000 bps
Network Interface	Bipolar, RJ48S 8-pin modular jack
User Interface	CCITT V.35, 34-pin female
Management Interface	RS-232, strappable for SLIP (SNMP and Telnet) or console operation
Modulation Technique	Bipolar, return-to-zero
Timing	Repeater (looped) for use on the public network, internal, or external
RTS/CTS Delay	56000 0.4mS $\pm$ 0.02mS 19200 1.0mS $\pm$ 0.1mS 9600 2.0mS $\pm$ 0.1mS 4800 4.0mS $\pm$ 0.2mS 2400 8.0mS $\pm$ 0.4mS
LED Indicators	DSR, RTS, CTS, DCD, TXD, RXD, TST, NIS
Power	120 $\pm$ 10% VAC, 57 to 63 Hz, 5 watts
Dimensions	9.6 inches deep x 6.25 inches wide x 1.6 inches high
Weight	2 pounds
Temperature	
Operating	32° to 122° F, 0° to 50° C
Storage	-40° to 158° F, -40° to 70° C
Relative Humidity	0% to 95%, non-condensing
UL Compliance	Meets UL 1459 requirements

MULTIPURPOSE LABEL

APPENDIX D

The multipurpose label for the Routermate is found on the underside of the unit. It is illustrated here for reference.

4800 SERIES ROUTER _{mate} ™			
MAIN BOARD : SERIES HW/SW ____ / ____		FEATURE OPTIONS ☐ V.32bis ☐ ISDN U	
MEMORY OPTIONS : ☐ 4M Dram SIMM ☐ 2M Flash		Compression : ☐ STD ☐ HI PERF Encryption : ☐ STD ☐ HI PERF ☐ PROP	
SERIES HW ____			
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) this device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.			
This device complies with Part 68 of the FCC regulations. T1 CSU/DSU Reg No. : 1R5USA-23055-DE-N 56K CSU/DSU Reg No. : 1R5USA-23056-DE-N 56K/64K CSU/DSU Reg No. : T1 DROP & INSERT Reg No. : 1R5USA-31067-DE-N ROUTER plus T1 CSU Reg No. : 1R5USA-24168-DE-N ROUTER plus 56K CSU Reg No. : 1R5USA-24165-DE-N V.32 MODEM Reg No. : 1R5USA-24168-DE-N Ringer Equivalence :		For T1 CSU/DSU : This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Pour T1 CSU/DSU : Cet appareil numerique de la classe A respecte toutes les exigences du Reglement sur la material du Canada.	
POWER TRANSFORMERS ☐ P/N 550-0366-01 ☐ P/N 550-0366-02		BAR CODE LABEL	
LABEL	LABEL	LABEL	
MANUFACTURED BY			
		9020 Junction Drive Annapolis Junction, MD 20701-1104, U.S.A.	
E-mail: info@osicom.com		http://www.osicom.com	
		179-0493-01 REV	

Figure D-1. Multipurpose Label - Routermate

INDEX

A

- Authentication traps 3-16
- Auto-learn clients 3-16

C

- Cables, part numbers B-1
- Client IP addresses 3-17
- Configuration menu 3-10
- Console interface 2-6
- Console mode 2-6, 2-7, 3-13
- CTS control 3-10
- Customer support 4-1

D

- Defaults restart 3-13
- Diagnostics, DSU 3-6
- Digital loop 3-8
- DSR control options 3-11
- DTE connector 2-4

E

- Equipment return and repair 4-1

H

- Header, screen; edit 3-12

I

- Inactivity Timeout 3-12
- Installation
 - SNMP 2-7
 - Telnet 2-7
 - terminal 2-6
- Installation checklist 2-2
- Interfaces
 - console 2-6, A-1
 - DTE 2-4, A-1
 - NI 2-4, A-1
 - SLIP A-1
 - V.35 A-1
- IP address 3-15

K

- Keys and conventions, terminal 3-2

L

- Line status, DTE 3-9
- Local loop 3-7
- Logoff 3-5

M

- Main menu 3-5
- Maintenance services 4-1
- Management menu 3-15
- MIB, enterprise 2-8
- Multipurpose label D-1

N

- Network connection 2-4
- NI interface 2-4, A-1

O, P

- Order numbers, hardware B-1
- Part numbers
 - cables B-1
 - hardware B-1
- Password 3-4, 3-13

R

- Read-Only Community parameter 3-16
- Read-Write Community parameter 3-16
- Remote digital loop 3-8
- Return goods authorization 4-1

S

- Selftest 3-6
- Service Information 3-14
- Service, phone number 4-1
- SLIP management; installation 2-7
- SNMP management options 3-15
- Software restart 3-13
- Speed 3-10
- Subnet mask 3-15

Support plans 4-1
System restart 3-13

T

Telephone numbers 4-1
Telnet 2-7, 3-16
 accessing via 3-3, 3-4
 disconnecting 3-5
Terminal connection 2-6
Terminal operation 3-1
Terminal screens
 configuration 3-11
 diagnostics 3-6
 main menu 3-5
 management 3-15
 SNMP trap client table 3-17
 unit menu 3-12
Terminal selection 3-3
Timing 3-10

U, V

Unit menu 3-12
V.35 interface 2-4, A-1